The Complete Guide to Surge Protectors

Chances are good that you have a few surge protectors plugged in around your home. These are very important, especially for expensive electronics. However, understanding how surge protectors work can help you make better buying decisions in the future, whether you're purchasing consumer or industrial products.

What Is a Surge Protector?

These days, most people have multiple components that all work together. For example, you may have your smart TV, a gaming console, a Blu-Ray player, and a sound system all connected together in order to provide the ultimate entertainment experience. You may also use a computer with multiple monitors, a printer, and a set of speakers. Surge protectors are typically built into power strips, which provide additional electrical outlets right at the source. Although this is very convenient, surge protectors have one primary function – to protect your equipment from electrical damage.

How a Surge Protector Works

When you plug multiple items into a surge protector, it passes the electrical current from the original outlet to all of the outlets on the strip, which provides power to every device plugged into that strip. Then, if the voltage at the original outlet spikes, or rises above safe levels, the surge protector sends the extra electricity into a grounding wire built directly into the strip. Simply put, without the surge protector, your equipment would be damaged in the event of a spike.

What Causes Power Spikes?

Although most people assume that lightning is the most common cause of a power surge, this is not the case. In fact, most lightning strikes are too powerful for a consumer-grade surge protector, and will quickly overwhelm it. You should always unplug your devices during a lightning storm. Surge protectors are designed to protect your equipment from other causes of spikes and surges. Commonly, these are caused by high-power equipment like air conditioners. The amount of electricity required to start these devices is very great, and this creates a high, sudden demand for power that upsets the steady flow of voltage through your wires.

Types of Surge Protectors

There are two main types of parallel circuit surge protectors available, and they both provide the same set of benefits.

- **Metal Oxide Varistor, or MOV –** You can think of this type of surge protector as a pressure valve. When there is just the right amount of current, it does nothing. When the current is too high, it diverts *only* the extra current, but allows the right amount of current to continue flowing.
- **Gas Discharge Arrestor –** This type of surge protector uses an inert gas to help divert the flow of current. It works much like an MOV, too. When the current is just right, the gas is a poor conductor. However, when there is too much current, the gas is ionized to become an excellent conductor, allowing it to divert electricity safely to ground. It continues to pass current until the voltage is normal.

Some manufacturers have designed protectors with series circuits, claiming that these offer more effective protection since they act quickly and do not flush extra current thorough a ground line, which could disrupt a building's electrical system. However, both methods work well, so it is up to you to decide which surge protector is right for your needs.